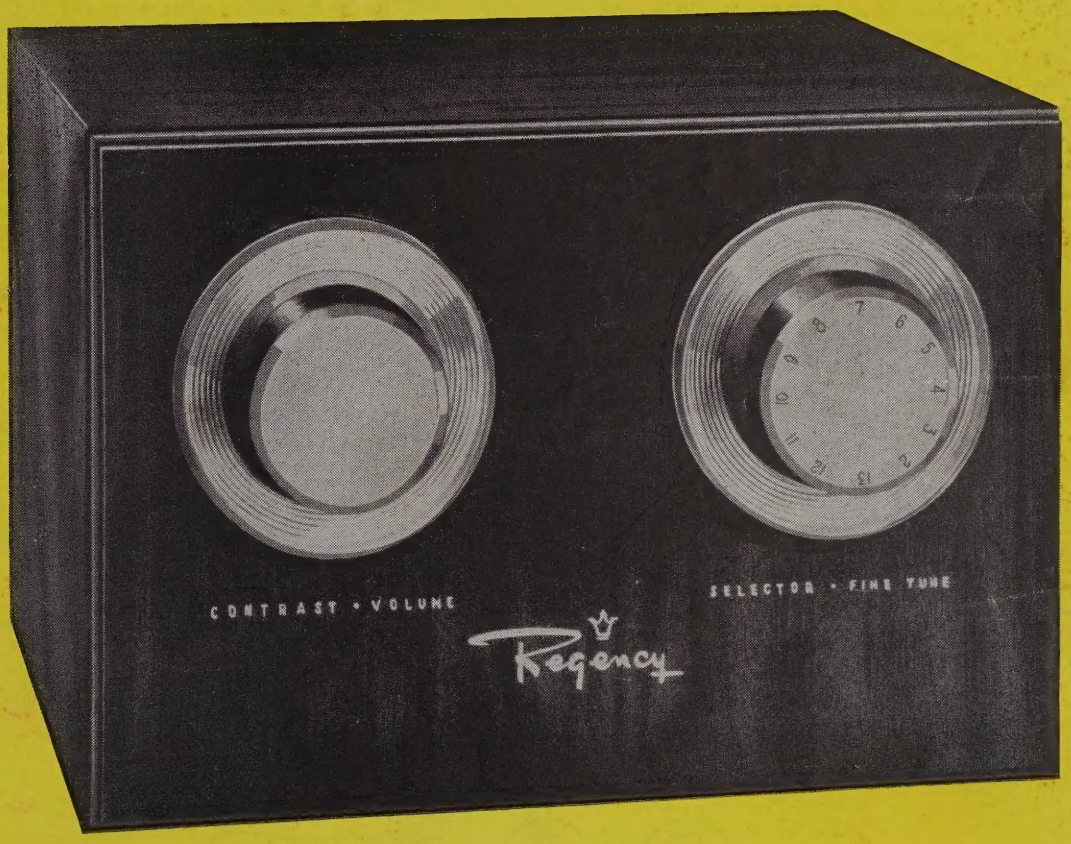
Make Seperate File

Regency

REMOTE TV TUNER

MODEL RT-700



INSTALLATION MANUAL

IS-10-053

DESCRIPTION

The Regency Model RT-700 is a remote tuning device which permits the normal operation of a television receiver from a location removed from the receiver. It enables the viewer to select the channel, to adjust the fine tuning, and to set the volume and contrast levels to his preference without approaching the receiver.

This unit is unique in design in that no mechanical action takes place in the receiver. There are no solenoids or latching mechanisms required for its operation. The controlling action is completely electronic. A further refinement of the design of this unit does away with the bulky cable so commonly associated with most remote control units. The three controlling signals are conducted by means of single shielded lead.

A self-contained, half-wave power supply powers the cascode tuner and a selenium rectifier supplies voltage to the contrast control circuit. By making a simple wiring change, the output polarity of the second supply can be reversed so that this remote tuner may be used with receivers requiring contrast bias voltages of opposite polarity.

The normal operation of the receiver to which the remote unit is attached is not affected when the remote unit is not being used. The connections of the three controlling signals are made in such a way that normal operation of the receiver is obtained when the remote unit is turned off.

An antenna connection must be made to this tuner and terminals are provided for this purpose on the rear of the unit. Also occupying a position on the rear panel is a Local-Distant switch. This changes the bias on the R.F. amplifier in the remote unit to compensate for extremely strong or weak signals.

The front panel control knobs include the station selector, fine tuning, volume and contrast. The switch controlling the A.C. power is on the contrast shaft.

INSTALLATION

1. The first step in the installation of the remote tuner is the selection of the proper unit for the receiver. The Model RT-700-21 and the Model RT-700-41 differ only in their output I.F. frequency—the RT-700-21 is for receivers employing 21 Mc and the RT-700-41 for 41Mc. These two frequencies are used in the majority of television receivers now in use.

2. The type of AGC circuit used in the receiver determines the connection of the contrast bias line. The next step then is to determine what type of AGC circuit is employed in the receiver to which the remote unit is to be attached. The three basic AGC circuits which have been and are being used are shown under A (Simple Rectified AGC), B (Keyed AGC), and C (Amplified AGC).

A. Simple Rectified AGC.

This circuit utilizes the rectified video signal as the source for AGC voltage. A filter network smooths out the video signal resulting in a DC voltage whose amplitude is proportional to signal strength.

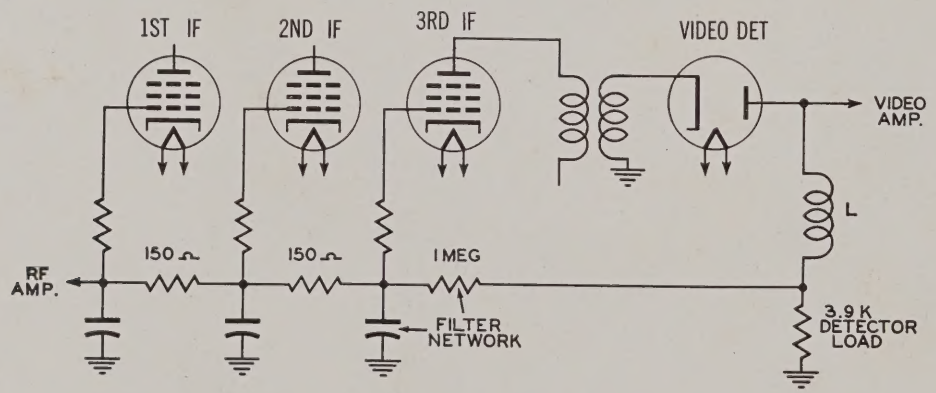


Figure 1.

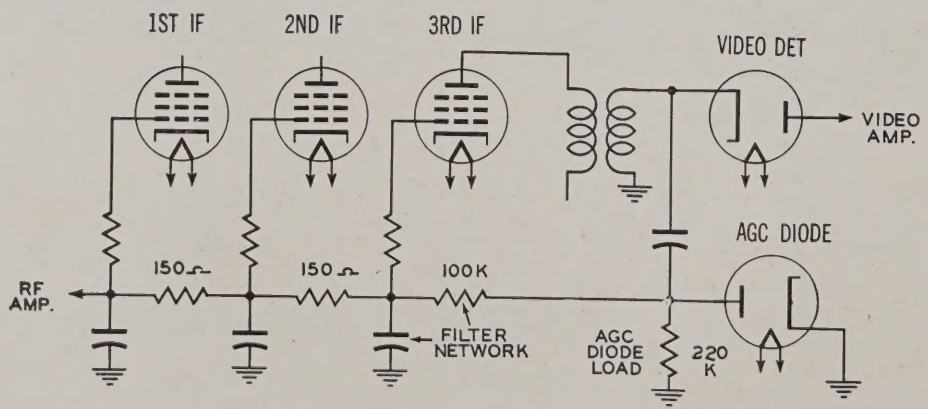


Figure 2.

This circuit is similar to the one above except that it employs a separate diode for rectifying the IF signal to provide a source for the AGC voltage.

B. Keyed AGC.

AGC voltage is developed in this circuit by means of a sampling process of the amplitude of the sync pulse. Operation of the circuit relies on the conduction of the AGC tube only during the sync pulse time. This accomplished by applying a positive pulse to the plate of the AGC tube during sync pulse time. This pulse is provided by the horizontal output circuit. A positive going video signal is applied to the grid and the degree to which the tube conducts will be governed by the amplitude of the sync pulse. Thus, an AGC voltage is developed which is proportional to the signal strength.

This type of AGC circuit is most readily identified due to the presence of a horizontal pulse on the plate of the stage and a video signal on the grid.

The horizontal pulse for this circuit is generated by means of a winding on the horizontal output transformer or the width coil. A video signal is applied to the grid from the video amplifier or sync separator.

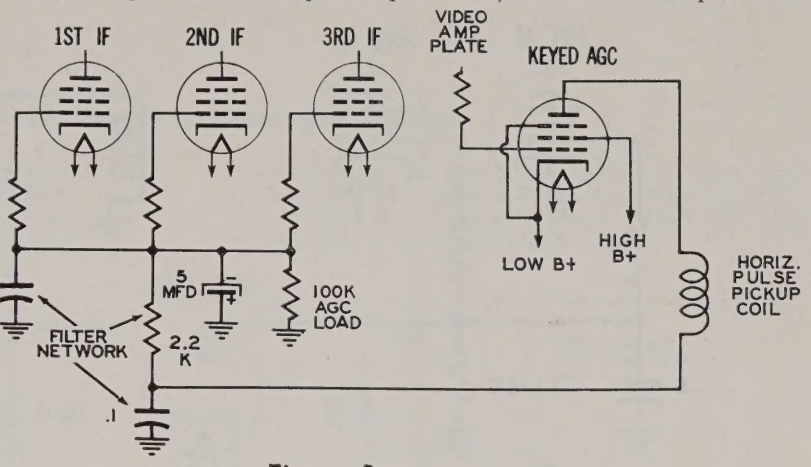


Figure 3.

This circuit is essentially the same as the one above except that the horizontal pulse is capacitively coupled to the AGC tube plate.

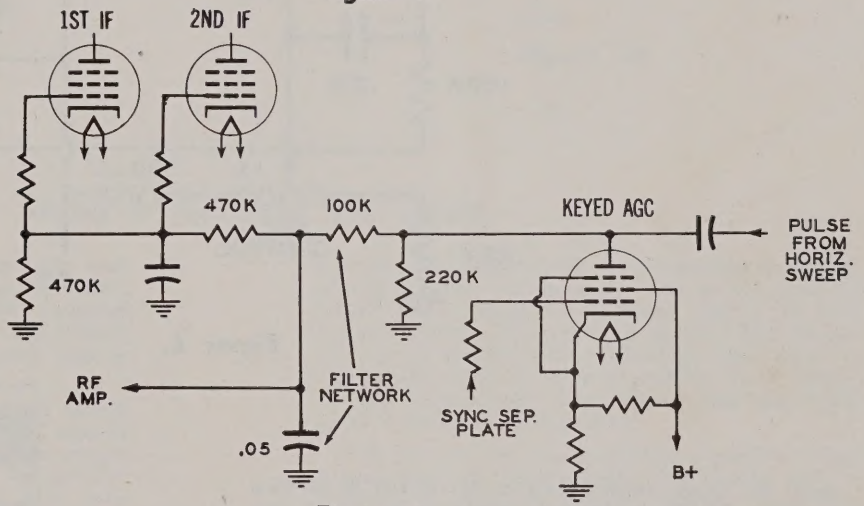


Figure 4.

C. Amplified AGC.

This AGC system employs a DC amplifier to develop the voltage for controlling the gain of the receiver. A DC voltage proportional to the signal strength is applied to the stage to control its conduction. Normally, the cathode is returned to a B- point while the plate load is returned to ground. Thus, conduction of the tube produces a minus voltage on the plate. This voltage is filtered and utilized as an AGC voltage.

This type of circuit can be identified by the fact the DC path of the AGC line is returned to the plate while DC voltages only are present on all elements of the stage.

The varying bias for the control of the AGC amplifier stage in this circuit is obtained from a cathode follower stage normally referred to as an AGC Rectifier. The filter capacitors in the cathode circuit maintain the cathode voltage at a level which is governed by the amplitude of the signal being applied to the grid. As the signal level changes, the conduction of the AGC amplifier is varied resulting in a change in AGC level.

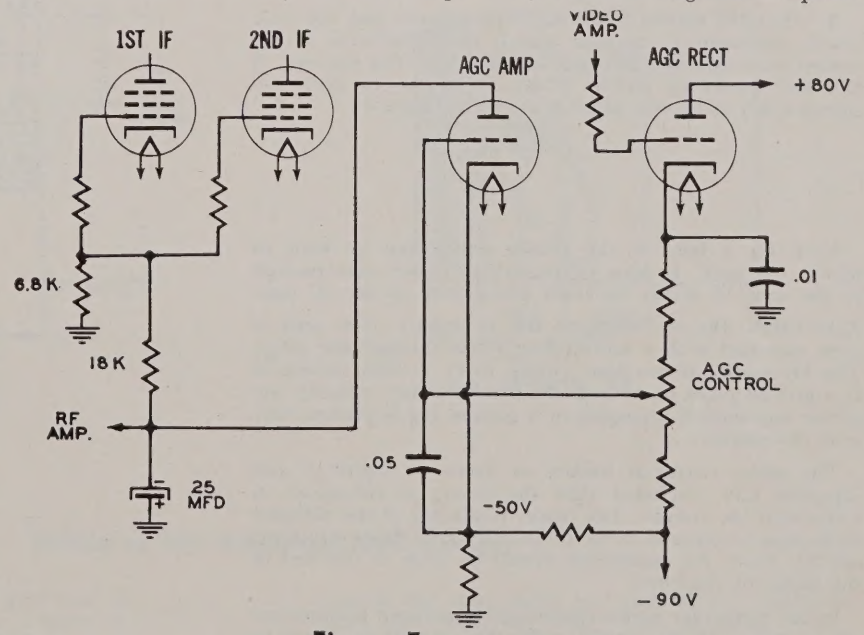


Figure 5.

This circuit differs from the preceding one in that a diode is employed as a rectifier to establish a reference voltage for control of the AGC amplifier.

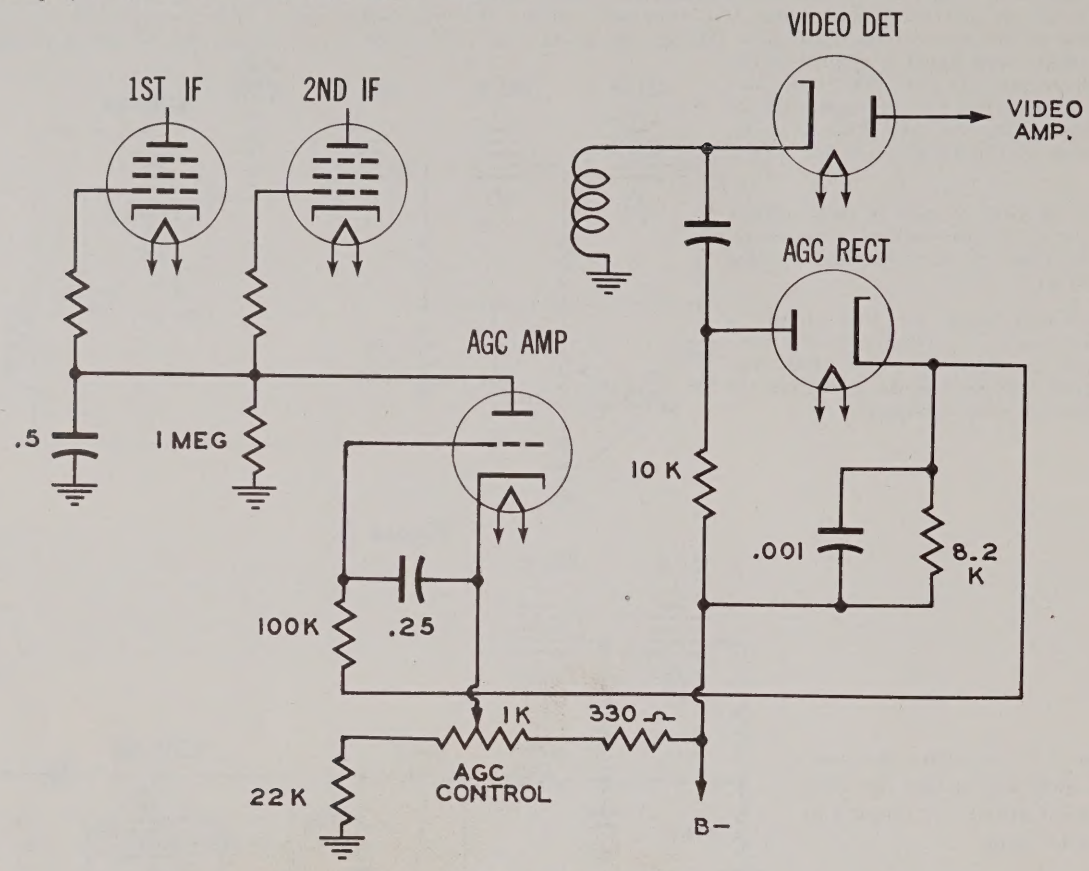


Figure 6.

Select the circuit which is used in the receiver in question and follow the instructions for connecting the remote unit to that type of AGC circuit.

Note: There are many variations of each of these types of circuits. The installer has only to determine the basic type of circuit since this will determine the installation procedure to be used.

3. After the correct tuner has been selected and the AGC circuit determined, the next step is the installation of the potted unit (M6 on the tuner schematic) in the receiver. A location should be chosen which allows the IF grid lead (green wire) to be very short as shown in Figure 7.

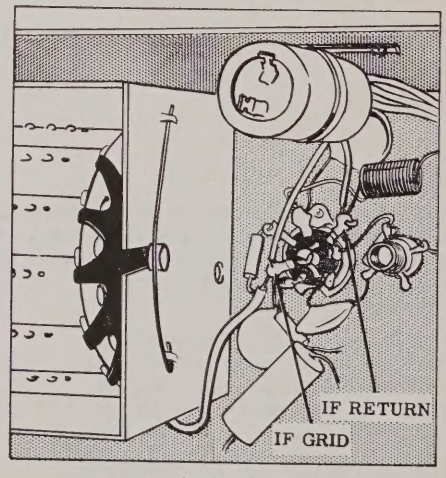


Figure 7.

Look for a hole in the chassis which can be used to mount the unit. If none is present, drill one near enough to the first IF socket to allow connection of the IF lead. (CAUTION—Do not lengthen the IF leads.) The unit is then mounted with a self-tapping screw through the strap. The IF ground return lead (white wire) is then connected to a ground point on or near the first IF socket (usually one of the terminals is grounded or a ground lug is present very near the socket).

The audio circuit is broken as shown in Figure 8 and capacitor C30 (included with the tuner) is connected in series with the circuit. The center conductor of the shielded audio lead is soldered to the common lead of the two sections of C30. Note: No connection should be made to this end of the shield of this line.

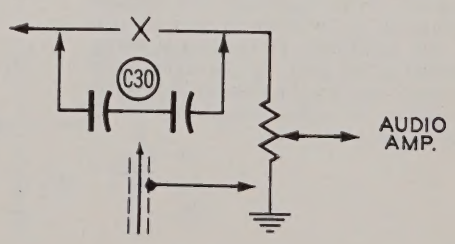


Figure 8.

In the event that a tone compensation network is employed ahead of the volume control, make the connections shown in Figure 8 at the output of the audio detector right after the

de-emphasis network, if used.) This will place the remote volume control circuit ahead of the tone compensation network.

This completes the installation of the potted unit except for the connection to the AGC line of the receiver. Three sets of instructions are given below for making this connection. Follow the one listed under the type of AGC circuit employed in the receiver as previously determined.

A. Wiring to the Simple Rectified AGC Circuit.

If the value of the resistor in the AGC filter network is 1 megohm or more, wire as shown in Figure 9. If the value of this resistor is less than 1 megohm, make connections as shown in Figure 10. R17, R18, (when used) and C29 should be installed close to the AGC line. The yellow and black leads from the potted unit are then connected as shown. Note: R17, R18, and C29 are included with the tuner.

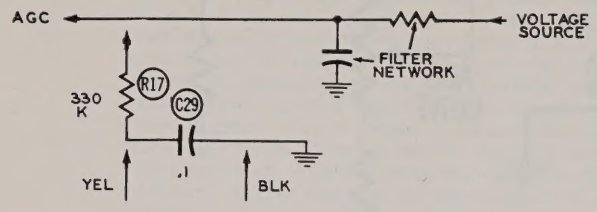


Figure 9.

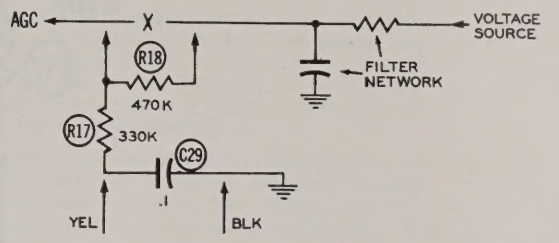


Figure 10.

B. Wiring to the Keyed AGC Circuit.

In all circuits of this general type, the grid lead to the keyed AGC tube must be broken at "x" shown in Figure 11. Install R17, R18, and C29 (included with the tuner) close to the tube socket and connect the yellow and black leads from the potted unit as shown in Figure 11.

The contrast return line (black wire) is shown connected to the cathode of the keyed AGC tube in Figure 11. If a point is available in the power supply of the receiver which is 10 to 20 volts less positive than the voltage present on the keyed AGC tube cathode, connect the contrast return line (black wire) to this point. Since this return line is also a return line for the volume control circuit, the point to which the black wire is connected must be bypassed to ground by at least 10 mfd. This condition is satisfied in most receivers. In those sets that do not have the return point adequately bypassed, add a 10 mfd. capacitor between this point and ground. Note: Should little or no control of the volume or "sync buzz" be experienced from the remote position while making the operational check, it is probable that this return point is not properly bypassed.

This type of AGC circuit requires a positive voltage output from the remote unit. The remote unit, as supplied, is wired for negative output. To reverse the output polarity, the white wire to one end terminal of the "Coarse Bias Adj." potentiometer must be transferred to the other end terminal (see Figure 12).

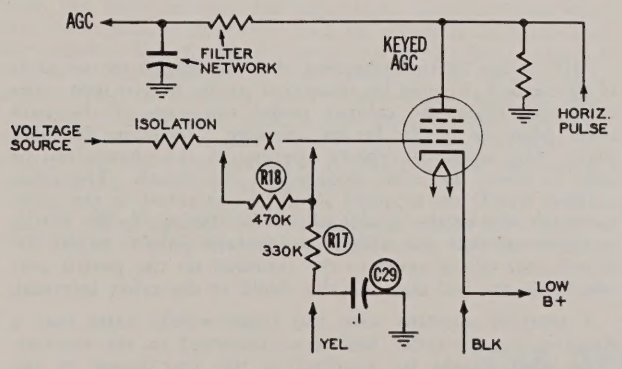


Figure 11.

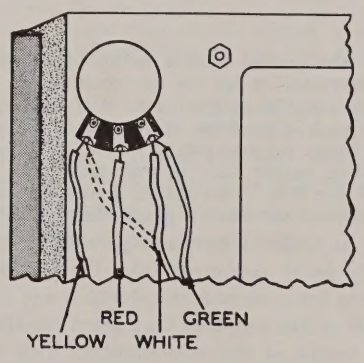


Figure 12.

C. Wiring to the Amplified AGC Circuit.

In all circuits of this general type, the grid lead to the AGC tube must be broken at "x" in Figure 13. Install R17, R18, and C29 (supplied with the tuner) close to the tube socket and connect the yellow and black leads from the potted unit as shown.

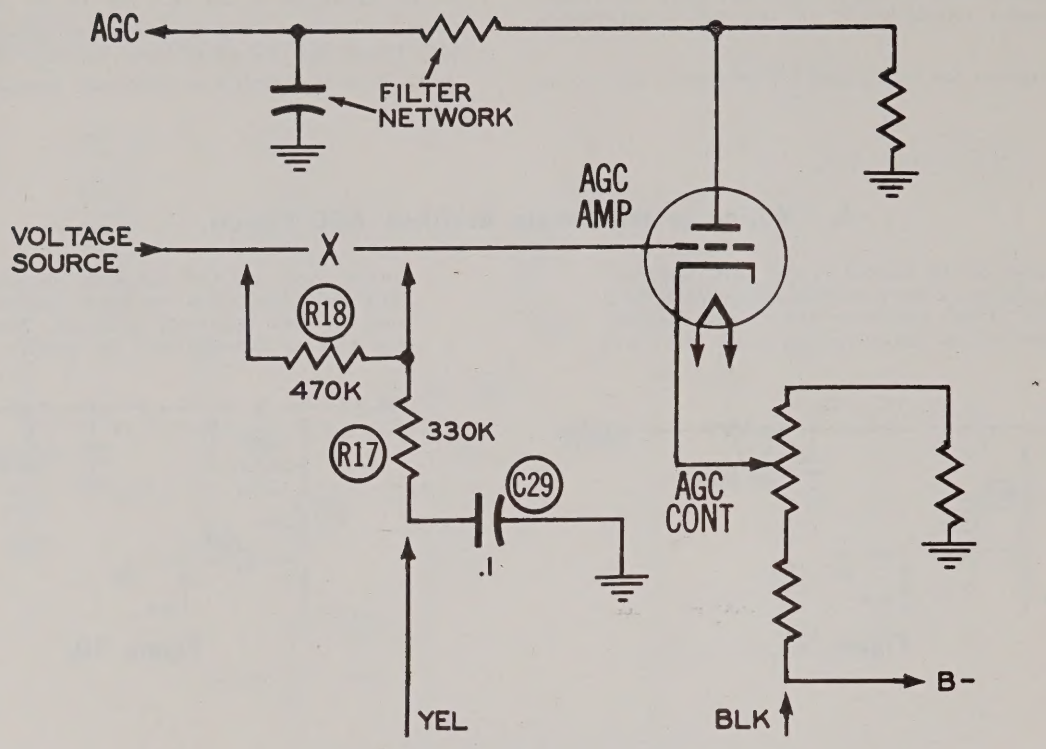


Figure 13.

Most receivers employ a voltage divider network as shown in Figures 5 and 6 to obtain the proper voltage at the cathode of the amplified AGC tube. In many cases, an AGC control is included in the divider network to provide some adjustment of the AGC operation. To prevent the disruption of the normal operation of this circuit, it is necessary to have a return point which is more negative than the voltage present on the cathode. Thus, the connection of the contrast return line is made to the B- line in the receiver. This will usually be the most minus point in the power supply.

This connection also serves as the return line for the volume control circuit, making it necessary that this point be adequately bypassed (10 mfds. or larger) in order to provide proper volume control action. Most all receivers employ a filter capacitor between the B- line and ground. However, in the event that no such bypass capacitor is present, one should be added. Note: Should little or no control of the volume be experienced from the remote position while making the operational check, it is probable that this return point is not properly bypassed.

This type of AGC circuit requires a positive voltage output from the remote unit. The remote unit, as supplied, is wired for negative output. To reverse the output polarity, the white wire to one end terminal of the "Coarse Bias Adj." potentiometer must be transferred to the other end terminal (see Figure 12).

4. After the potted unit is mounted in the receiver, the final consideration is for the interconnecting cable between the receiver and the remote unit. If the cable supplied with the remote unit is too long, do not cut it off. The excess line should be coiled up and placed inside or behind the receiver cabinet. If a longer line is required, it is permissible to splice onto the line. This splice should be performed using extreme care to see that a good electrical and mechanical connection is made. Electrical tape should then be used to insulate the inner conductor from the shield and to cover the complete splice so that the shield is not exposed. If the total length of line required on a given installation is nearly twice the length of the line supplied with the unit, it is recommended that the line be extended so that it is exactly twice the length of the one supplied with the unit. The excess can be coiled up and placed out of sight.

After it has been determined that the length of the cable is satisfactory, it must be connected to the potted unit. The cable can enter the cabinet under the edge of the back cover plate or it can be fed through a hole in the back plate. Any small convenient opening in the chassis can be used to bring the cable underneath the chassis. The cable anchors which are supplied should be attached to the cable on either side of the chassis to prevent damage to the wiring in the event that the cable is accidentally pulled. Solder the center lead of the cable to the terminal on the potted unit which has the red dot, and the shield to the other terminal.

A label is supplied with the tuner which states that a Regency remote tuner has been connected to the receiver. This label should be attached to the rear apron of the receiver chassis in plain view.

This completes the installation of the remote tuner. An operational check should now be made.

OPERATIONAL CHECK

Plug the line cords of the receiver and the remote unit into convenient outlets. Turn on both units and allow sufficient time for warmup. Connect the antenna lead-in to the antenna terminals of the remote tuner. Proceed with the following steps in the order given.

Step 1. Set contrast control of the receiver to maximum and the contrast control of the remote to minimum. Set "Local-Distant" switch on rear of remote unit to "Distant" position.

Step 2. Select channel on the remote unit which provides the strongest signal. Rotate channel selector on receiver to a different channel.

Step 3. Set the "Coarse Bias Adj." potentiometer so that a faint picture is obtained while still retaining synchronization. If difficulty is experienced in obtaining synchronization, set the "Local-Distant" switch to "Local" position and reset "Coarse Bias Adj." as outlined above. In some installations it may be necessary to reduce the setting of the contrast control in the receiver to obtain proper operation of the remote unit. If such is the case, adjustments on the remote unit should be made as outlined above with this control at the reduced setting. Also the user should be instructed to leave the receiver contrast control in this position when using the remote tuner. Note: Should an interference pattern be encountered, it may be resulting from local oscillator radiation from the tuner in the receiver. Rotate receiver channel selector to a position where interference disappears.

Step 4. Adjust fine tuning of the remote tuner for the best picture (or sound in non-intercarrier receivers). Advance contrast control on the remote tuner to see that satisfactory contrast range is obtained. Overload may be experienced at or near maximum contrast setting. This is normal in some installations and is of no consequence providing there is sufficient contrast range below the overload point. If adequate control of the contrast is not obtained, recheck procedure performed under Step 3 making sure that all alternate procedures have been tried.

Step 5. Set volume control of remote unit to maximum. Adjust volume control on receiver to a setting which provides a volume level slightly above normal. Then reduce the setting of the remote unit volume control. Adjustment of this control should provide complete control from the original maximum to a barely perceptible level. If adequate control of volume is not obtained, or hum is encountered, recheck installation procedure dealing with the connection of the contrast return line.

Step 6. Check operation on all other available channels. It might be necessary to change the setting of the channel selector in the receiver if interference is noted. Normally, a setting can be found which will not cause interference on any of the desired channels.

If satisfactory operation is obtained on all available channels, including adequate control of contrast and volume by the remote unit, the installation can be considered completed. It might be necessary to adjust the oscillator slugs, accessible through a hole in the front of the tuner, in order to obtain proper tuning range on some channels. Note: If both an extremely weak and extremely strong signal are to be received, it may be necessary to transfer the "Local-Distant" switch accordingly. If overloading is not experienced on any channel with the switch in the "Local" position, the switch can be left in this position at all times.

If the installation has been made in the service shop and the receiver cabinet is still in the customer's home, it is recommended that the cable be disconnected from the potted unit for ease in transportation. This will also facilitate the routing of the cable in the final installation. If the receiver cabinet is also in the service shop, it is recommended that the cable be left connected to the potted unit and the receiver chassis be mounted in the cabinet. Then, in the event that a free end of the cable is required when the final installation in the home (or business establishment) is being made, the cable can be disconnected at the remote tuner.

HOME INSTALLATION

After the respective locations of the receiver and the remote tuner have been determined, it now becomes necessary to route the cable between the two units. Keep in mind that the tuner must be located so that AC power is available and the antenna lead-in can be connected to the unit. One of the main considerations for the routing of the cable is that of satisfying the customer. Several alternative methods may be used. Among these are: Following the baseboard and woodwork, under the floor, under edge of wall-to-wall carpeting, etc. Make sure the cable is placed so that the insulation will not be worn or punctured.

If the use of a booster is desirable, it should be located adjacent to the remote tuner. Connect the antenna lead-in to the booster input terminals and the output of the booster to the remote tuner by means of a short length of 300 ohm line. The AC power for the booster can be obtained from the socket provided at the rear of the remote tuner. The power to this socket is controlled by the "On-Off" switch of the tuner.

Check operation of the unit on all available channels. If the "Local-Distant" switch must be transferred to obtain proper operation on any channel, the user should be instructed as to its proper use. Also it is wise to show the customer the proper settings of the receiver controls that permit proper operation of the remote unit.

UHF OPERATION

The Regency Model RT-700 Remote Tuner can be adapted to UHF reception by insertion of UHF tuning strips into the tuner drum. Up to six UHF strips can be installed, one in each alternative position.

Obtain a set of UHF strips for each desired UHF channel. Make sure that the proper strips are obtained for the particular model Remote Tuner into which the strips are to be installed. Check the parts list in this manual for the proper part number.

Remove a pair of VHF strips of an unused channel for each UHF strip to be installed. These UHF strips cannot be installed in adjacent positions, however. Install the UHF strips as outlined in the instructions packed with the units.

Rotate the tuner drum to the position in which the UHF strip was substituted and adjust the oscillator slug for proper reception and fine tuning range.

In order to obtain satisfactory reception of UHF transmission, the antenna and lead-in must be installed consistent with good UHF installation practices. If poor results are obtained, make sure that a good UHF signal is available at the tuner terminals before suspecting improper operation of the tuner.

WARRANTY

The remote TV Tuner is sold under the standard RTMA warranty, which warrants it to be free from defects in material and workmanship. We agree to remedy such defect or to furnish a new part in exchange for any part, which, under normal installation, use and service, discloses such defect, provided the unit is delivered to us, intact, for our examination, with all transportation charges prepaid to our factory, within ninety days from the date of sale to the original purchaser, and provided such examination discloses, in our judgment, that it is thus defective.

This warranty does not apply if the remote TV Tuner has been subjected to misuse, neglect, accidents, incorrect wiring not our own, improper installation, or to use in violation of instructions furnished by us, nor to remote TV Tuners that have been repaired or altered outside our factory.

This warranty excludes all oral or other and implied warranties, and the manufacturer shall in no event be liable for damages for a breach of warranty in an amount exceeding the purchase price of the alleged defective equipment.

PARTS LIST

V1 6X4
V2 6BQ7
V3 6J6
V4 6BQ7
V5 6J6

C1 A 20mfd 350 working volts
C1 B 20mfd 350 working volts
C2 30mfd 150 working volts
C3 .01 mf
C4 1.0 mf
C5 100mmf
C6 100mmf
C7 100mmf
C29 .2 mf
C30 A .02 mf
B .02 mf

Resistors—½ watt unless otherwise specified.

R1	A 100K	Contrast Control & Sw.	100-516-1
	B 250K	Volume Control	
R2	100K	Coarse Bias Adj.	100-518-1
R3	10K — 2W		
R4	~~150~~ Ω 330		
R5	47 Ω		
R17	330K Ω		
R18	470K Ω		
T1	Power Transformer		300-341
L1	R. F. Choke		100-517
M1	A 21 m.c. Tuner (Includes: 68 thru C25, R6 thru R15, L2 thru L8)		
M1	B 41 m.c. Tuner (Includes: C31 thru C52, R19 thru R29, L11 thru L21)		
M2	Selenium Rectifier		8Y1
M3	"Local-Distant" Switch		SS2
M4	Pilot Lamp		47
M5	Pilot Lamp		47
M6	Potted Unit (Includes: C26, C27, C28, R16 & L10		300-347
M7	UHF Strips		

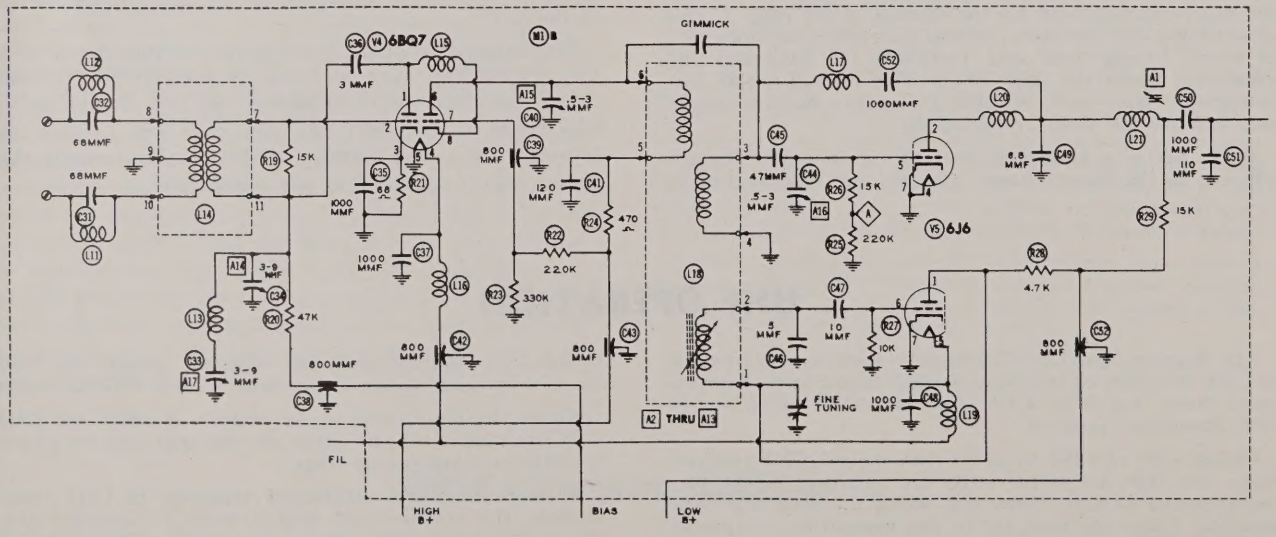


Figure 14. 41 MC Tuner

(A Standard Notation Schematic, © Howard W. Sams and Co., Inc.)

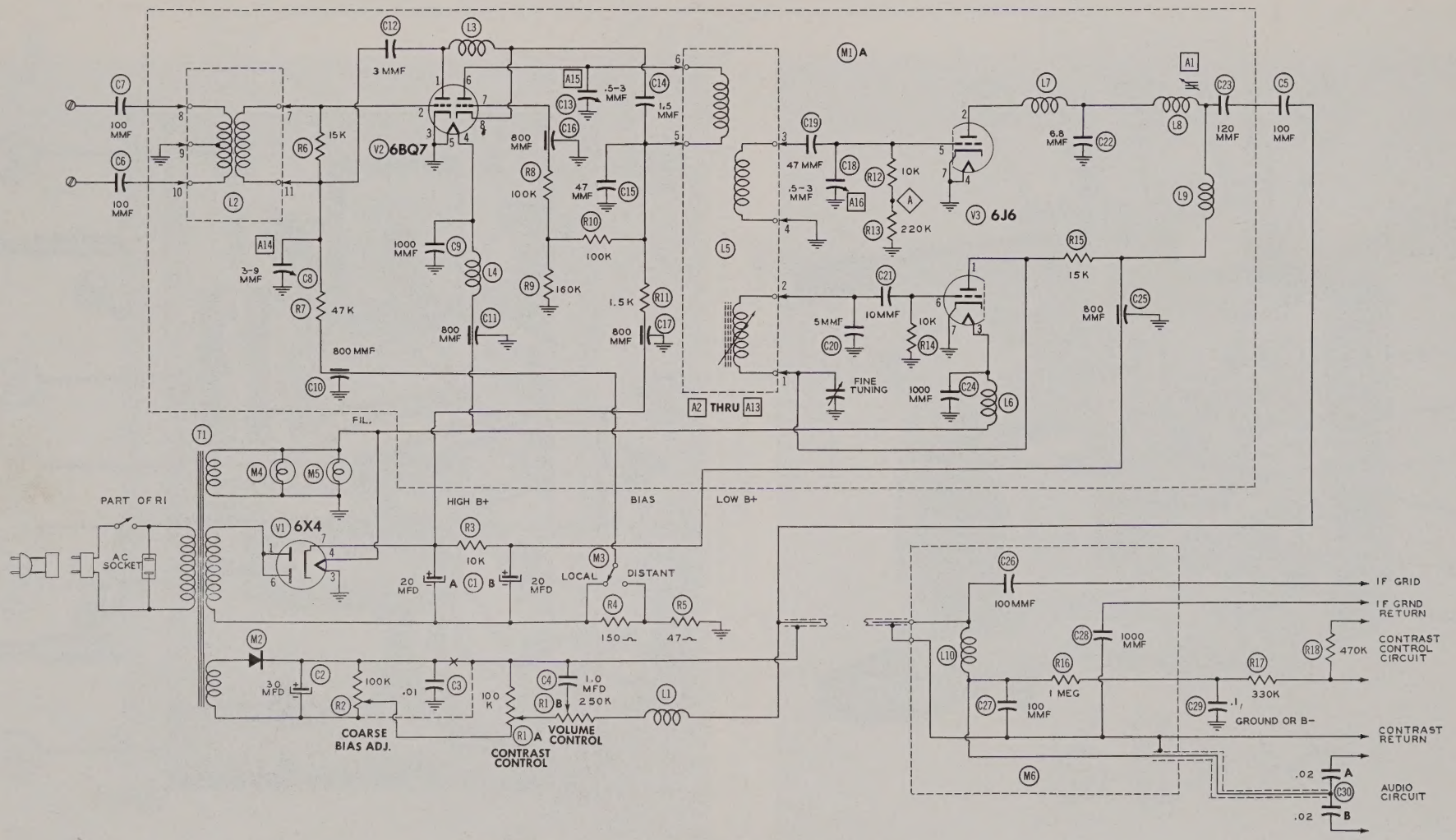
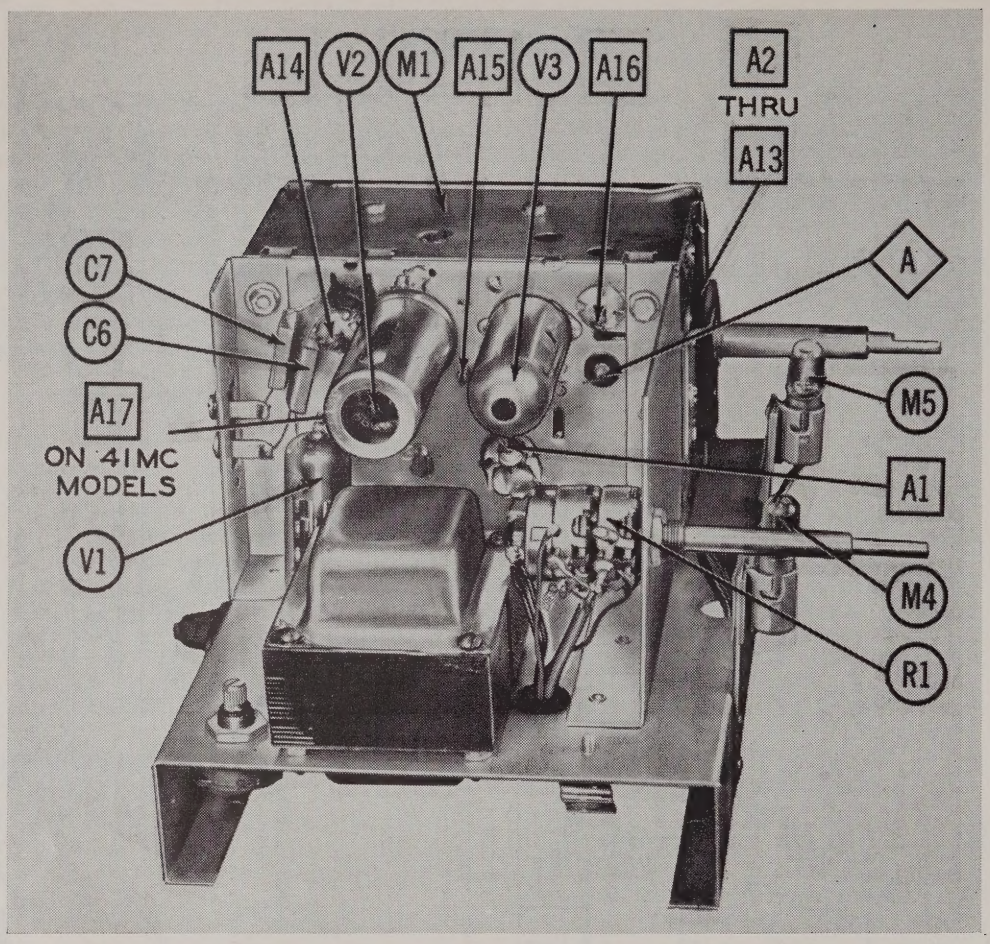
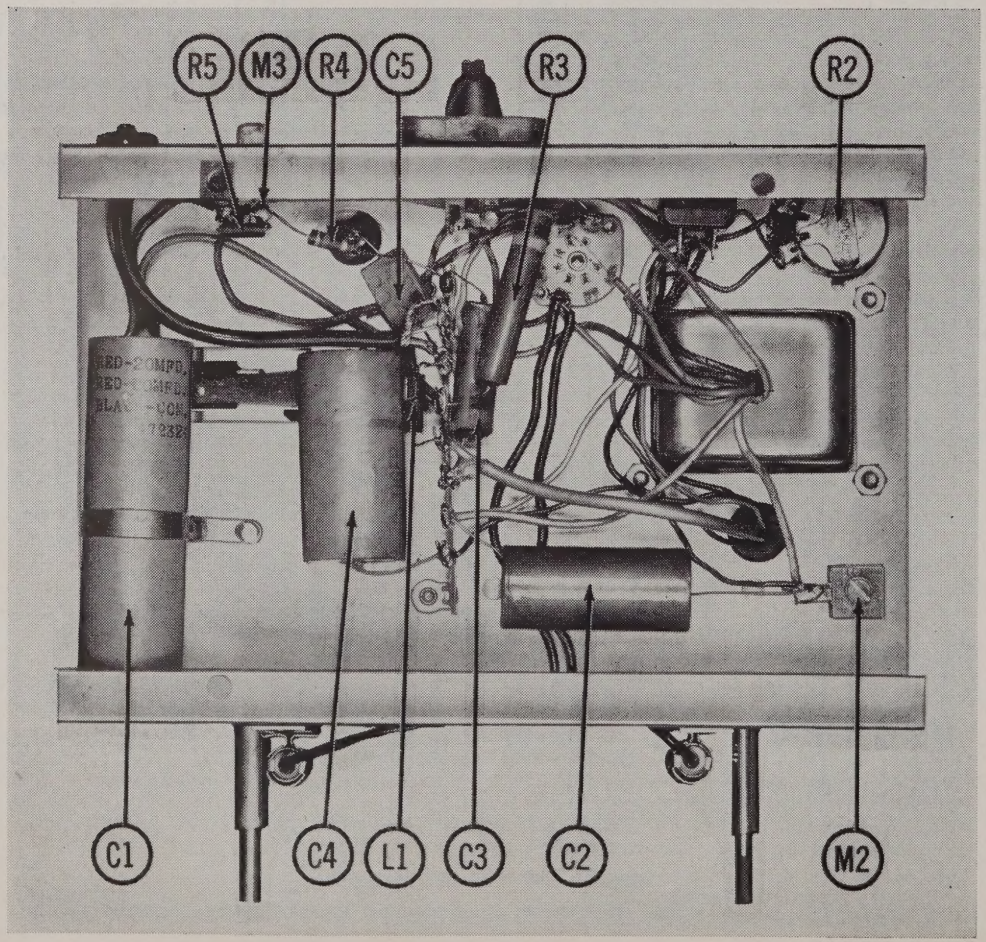


Figure 15. Regency RT-700 Remote Tuner

(A Standard Notation Schematic, © Howard W. Sams and Co., Inc.)


A14
V2
M1
A15
V3
A16
A2
THRU
A13
A
C7
C6
A17
ON 41MC
MODELS
V1
M5
A1
M4
R1


R5
M3
R4
C5
R3
R2
C1
C4
L1
C3
C2
M2

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Remove the 6J6 converter tube and replace with a 6J6 which has pin 1 removed. This will disable the local oscillator and reduce the possibility of erroneous indications.
Alignment instructions for the receiver should be consulted for proper bias application during alignment.
The video IF section of the receiver should be in proper alignment before tuner alignment is attempted.

OVERALL VIDEO IF RESPONSE CHECK

Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	Direct	High side to an ungrounded tube shield floating over dummy converter tube. Low side to chassis.	24MC (10MC Swp) for 21MC tuner 44MC (10MC Swp) for 41MC tuner	Sound IF and Video IF Freq. of receiver	Any	Vert. Amp. thru 47KΩ to video detector load. Low side to chassis.	A1	Check for response curve similar to Fig.16A or B, with markers as shown. If necessary, adjust A1 for desired response.

OSCILLATOR ALIGNMENT

The individual oscillator adjustment screws are reached through a hole in the tuner front, just to one side of the tuner shaft. The correct adjustment screw is accessible through this hole as the tuner shaft is turned to each channel.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Set the fine tuning control to the mid-position of its range.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
2.	Two 120Ω Carbon Resistors	Across antenna terminals with 120Ω in each lead.	213MC (10MC Swp)	211.25MC 215.75MC	13	Vert. Amp. thru 47KΩ to video detector load. Low side to chassis.	A2	Adjust to place video marker at 50% on response curve as in Fig. 16A or B.
			207MC (10MC Swp)	205.25MC 209.75MC	12		A3	
			201MC (10MC Swp)	199.25MC 203.75MC	11		A4	
			195MC (10MC Swp)	193.25MC 197.75MC	10		A5	
			189MC (10MC Swp)	187.25MC 191.75MC	9		A6	
			183MC (10MC Swp)	181.25MC 185.75MC	8		A7	
			177MC (10MC Swp)	175.25MC 179.75MC	7		A8	
			85MC (10MC Swp)	83.25MC 87.75MC	6		A9	
			79MC (10MC Swp)	77.25MC 81.75MC	5		A10	
			69MC (10MC Swp)	67.25MC 71.75MC	4		A11	
			63MC (10MC Swp)	61.25MC 65.75MC	3		A12	
			57MC (10MC Swp)	55.25MC 59.75MC	2		A13	

RF AND MIXER ALIGNMENT

Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
3.	Two 120Ω Carbon Resistors	Across antenna terminals with 120Ω in each lead.	207MC (10MC Swp)	205.25MC 209.75MC	12	Vert. Amp. thru 10KΩ to tuner point A . Low side to chassis.	A14, A15, A16	Adjust for maximum symmetrical flat-topped response as in Fig.17.
4.	"	"	213MC (10MC Swp)	211.25MC 215.75MC	13	"		Check for response as in Fig.17. If markers fall below 70% on any channel make slight compromise adjustments of A14, A15 and A16 with channel switch set to that channel, then recheck all other channels to see that they have not been seriously affected.
			201MC (10MC Swp)	199.25MC 203.75MC	11			
			195MC (10MC Swp)	193.25MC 197.75MC	10			
			189MC (10MC Swp)	187.25MC 191.75MC	9			
			183MC (10MC Swp)	181.25MC 185.75MC	8			
			177MC (10MC Swp)	175.25MC 179.75MC	7			
			85MC (10MC Swp)	83.25MC 87.75MC	6			
			79MC (10MC Swp)	77.25MC 81.75MC	5			
			69MC (10MC Swp)	67.25MC 71.75MC	4			
			63MC (10MC Swp)	61.25MC 65.75MC	3			
			57MC (10MC Swp)	55.25MC 59.75MC	2			

IF TRAP ADJUSTMENT (Found on 41MC Tuner)

The IF trap adjustment, A17, is for the reduction of interference from signals in the IF region. Tune to channel 2 and adjust A17 for minimum interference. Care must be taken to avoid tuning A17 into channel 2 response.
If no interference is noted, A17 may be turned fully clockwise and left in that position.

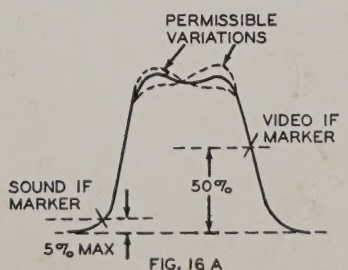


FIG. 16 A
(FOR INTERCARRIER RECEIVERS)

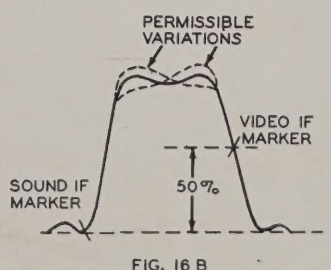


FIG. 16 B
(FOR NON-INTERCARRIER RECEIVERS)

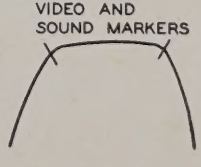


FIG. 17